Earnest

Events and Research News in Engineering and Science Today

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The Alumni Magazine of the College of Engineering and Science at Clemson University **Summer 2008**

Clemson researchers team up with Michelin to advance tire technology

A Clemson University research team affiliated with the Clemson University International Center for Automotive Research (CU-ICAR) will receive $1.9 million to develop new technology with Michelin North America, one of CU-ICAR's founding partners. The project will focus on reducing automotive tire rolling resistance, thereby improving vehicle fuel economy. Michelin chose Clemson to conduct a significant portion of the research after a competitive bid process for universities.

"This award is the direct result of academia and industry working together to create innovative solutions for one of the most pressing problems of our time, the global energy crisis," said Tom Kurfess, Clemson researcher on the project and director of CU-ICAR. "It is an important partnership because no one individual could accomplish this alone."

The project will engage the talents of numerous professors, and both graduate and undergraduate students. These mechanical engineering professors are working on the project:

- Tom Kurfess, holder of the BMW Chair in Manufacturing, focusing on manufacturing issues;
- John Ziegert, holder of the Timken Chair in Automotive Design and Development, focusing on design issues;
- Georges Fadel, ExxonMobil Employees Chair in Engineering;
- Paul Joseph, focusing on material modeling and design issues;
- Joshua Summers, focusing on design issues; and
- Laine Mears, focusing on manufacturing issues.

Michelin was one of the first partners in CU-ICAR, funding an endowed chair and associated laboratory in February 2004.

CU-ICAR is a new model for economic development in South Carolina, matching Clemson's strengths in automotive engineering with the state's strong automotive economic cluster. Located on the Interstate 85 corridor between Charlotte, NC, and Atlanta, GA, CU-ICAR is situated in the center of the Southeastern automotive and motorsports economy.

The 250-acre "technopolis" is where BMW, Michelin, Timken, SUN, SAE and other corporate partners are joining with Clemson to focus on automotive research and other transportation and advanced manufacturing issues.

The state of South Carolina also is a key partner, having created legislation to support economic development and innovation. For example, the Research Centers of Economic Excellence Endowed Chairs Program matches private funding to recruit top faculty. CU-ICAR has four endowed chairs created through the program. Three of these chairs, along with five junior faculty positions, have been filled. These faculty members, along with other faculty from the main campus, form the academic team for one of the nation's most exceptional graduate programs in automotive engineering. The doctoral program is one of the first in the country.

Michelin North America Chairman and President Jim Micali and Clemson President James F. Barker sign a $1.9 million research agreement at CU-ICAR.

Michelin North America and Clemson University officials at the research agreement event: David Stafford of Michelin, left; Tom Kurfess, director of CU-ICAR; Imtiaz Haque, mechanical engineering department chair; Clemson President James F. Barker; Jim Micali, chairman and president of Michelin North America; and John Ziegert, holder of the Timken Chair in Automotive Design and Development and professor of mechanical engineering.

On the inside

From the Dean

The spring/summer edition of *Earnest* is one I always look forward to because this is when we recognize student, staff, and faculty achievements.

This edition is particularly exciting because two of our students were named Goldwater Scholars, and another two received 2008 Google Anita Borg Memorial Scholarships (story, page 6). Both of these programs are national in scope, and are noted for keen competition among an incredible pool of qualified applicants. Having four students from one university named says a lot about the caliber of our engineering and science undergraduates and graduates.

I would call your attention to the story concerning Leadership Changes that appears on this page. We have several important promotions and additions that you'll want to know about. These are all dynamic, accomplished individuals, and we look forward to exciting advancements and developments in the months ahead.

The Faculty News and Notes appear on page 4. You'll notice that a number of them have received special regional, national and even international recognition. These honors and accomplishments speak volumes about the caliber of our College of Engineering and Science faculty.

It is always a delight to hear from our alumni, and on page 5, you'll see that our graduates are making contributions in a number important areas – academia, industry and government service.

I hope you enjoy reading about how our staff, faculty, students and alumni are bringing honor and distinction to the college and university, while contributing to the betterment of mankind across the nation and throughout the world.

Don't forget to let us hear from you! I wish you the best for a safe, relaxing summer.

Esin Gulari
Dean of the College of Engineering and Science

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College of Engineering and Science inducts three into academy

At the 13th annual Engineering and Science Banquet, the Thomas Green Clemson Academy of Engineers and Scientists welcomed three individuals for outstanding career success, contributions to community and notable contributions to engineering and science.

College of Engineering and Science Dean, Esin Gulari, congratulates the members of the 2008 Thomas Green Clemson Academy class (from left to right): Michael L. Watt, Tom Keinath, Dean Gulari, and John Petersen.

Tom Keinath was the first dean of the College of Engineering and Science, providing exceptional leadership by forging initially disparate academic units into a model of multidisciplinary collaboration and collegiality. Under his tenure, Keinath he guided efforts to increase research volume from approximately $15M in 1995 to $57M in 2005, making the College the University leader in competitive research.

As Dean, Keinath worked to launch several academic and research centers, perhaps the most ambitious of these is the Clemson University International Center for Automotive Research (CU-ICAR).

John Petersen came to Clemson as a member of the chemistry faculty in 1980 and was appointed associate dean of research in the College of Arts and Science. Research grew dramatically during his tenure.

As dean of the college of science at Wayne State University, he significantly grew faculty size and annual giving. In 2000 Petersen was selected to serve as chancellor and provost of the University of Connecticut, and four years later he was called to the University of Tennessee, where he currently serves as president.

Michael L. Watt is the president and chief executive officer of Scientific Research Corp., which provides electronic systems and engineering services to public and private sectors in countries around the world. SRC has a heritage in national defense and the global war on terror. Watt serves on numerous boards for corporations and academic institutions, including the Clemson University Advisory Board for the Department of Electrical and Computer Engineering. Watt earned a bachelor of science degree in computer engineering at Clemson and a master's in electrical engineering from Georgia Tech.

Leadership Changes

Hodges named school director

Larry F. Hodges has been named director of the School of Computing in the College of Engineering and Science, effective July 1. Hodges comes to Clemson from the University of North Carolina at Charlotte, where he served as professor and chairman in the department of computer science.

The School of Computing at Clemson was formed in 2007 as part of Engineering and Science Dean Esin Gulari's mission to prepare students for all aspects of computing and as part of a university-wide emphasis on information technology and high-performance computing to allow for rapid development of emerging, interdisciplinary research and academic programs.

In addition to his research work in clinical applications, Hodges has maintained an active research agenda in numerous other areas of virtual reality, visualization and 3D user interface design with more than 150 published papers.

Karanfil to lead EE&ES

Tanju Karanfil, professor of environmental engineering and earth sciences, has been named chair of the department. Karanfil completed his undergraduate work at Istanbul Technical University, and received his Master's and Ph.D. from the University of Michigan. Karanfil's primary teaching and research explores the use of carbon fibers for removing pollutants from water to develop new, more efficient treatment systems. He is a recipient of the National Science Foundation Early CAREER Award, and is active in a number of professional organizations, including the American Chemical Society, the American Water Works Association, and the International Association on Water Quality. Karanfil is replacing Alan Elzerman, who is stepping down as department chair after a 12-year tenure.

Ballato appointed associate vice president for research and economic development

Clemson University professor John Ballato, a leading international scholar in optical materials, has been appointed to serve as associate vice president for research and economic development focusing on advanced materials.

He will explore opportunities for major research initiatives and work with faculty to facilitate collaboration through interdisciplinary research teams. He also will coordinate Clemson's role in a major economic development initiative in the Advanced Materials Center in Anderson County, formerly Clemson Research Park.

A professor of materials science and engineering at Clemson, Ballato also directs COMSET, the Center for Optical Materials Science and Engineering Technologies, which is a South Carolina Research Center of Economic Excellence. He earned a bachelor's degree in ceramic science and engineering and a Ph.D. in ceramic and materials engineering from Rutgers University.

Collins assumes associate dean position

Professor **E. R. "Randy" Collins** has been named associate dean for undergraduate and international studies in the college. He joined the Department of Electrical and Computer Engineering at Clemson in 1989. He holds a B.S.EE from North Carolina State University and a Ph.D, in EE from Georgia Tech. Collins is a multiple winner of the department's teaching awards and received an outstanding teaching award from the IEEE in 1997. He is an active member of several IEEE societies, and has served in various leadership capacities in the local IEEE section.

Collins is taking the reins from Steve Melsheimer, who after 15 years as associate dean and 39.5 years in total service to Clemson, is retiring. Melsheimer made significant contributions to the college's study-abroad programs; laptop initiatives; engineering and science degree development; and ABET accreditation.

Cooper to be interim chair for E&SE

Melanie Cooper, Alumni Distinguished Professor of Chemistry has been named interim chair for the Department of Engineering and Science Education. She received her undergraduate and graduate degrees from the University of Manchester, England. She carried out postdoctoral work in organic chemistry before turning to chemical education as her area of research. Cooper has focused on problem solving in a wide variety of areas, including laboratories and large enrollment lectures. Cooper is replacing a retiring Ben Sill, who was a major contributor in establishing the Department of Engineering and Science Education.

Dale Earnhardt Inc. announces scholarship winner

Clemson University's first Motorsports Innovation Partner, Dale Earnhardt Inc. (DEI) has announced its annual undergraduate scholarship winner. Casey Appleman of Davidsonville, Md., a rising senior majoring in mechanical engineering, received the Dale Earnhardt Motorsports Scholarship at a presentation at DEI headquarters in Mooresville, N.C.

"The Dale Earnhardt Motorsports Scholarship supports the education of deserving students like Casey," said Dick Baker, executive director of the Dale Earnhardt Foundation. "He is exactly the kind of motivated, talented individual who will continue the legend of Dale Earnhardt and have a great impact on the future of motorsports."

"I am extremely excited and thankful that I was selected for the DEI scholarship," Appleman said. "Pursuing a career in the motorsports industry has been a lifelong goal for me, and having a race team with the winning tradition of DEI partner with Clemson University to foster education and develop technical innovations is very exciting. I'd like to thank DEI and Clemson University for offering me this opportunity to pursue my dreams."

The Dale Earnhardt Foundation funds the annual undergraduate scholarship honoring the memory of Dale Earnhardt Sr. for students interested in motorsports and automotive engineering. The Dale Earnhardt Foundation provides $13,000 annually for a three-year undergraduate scholarship for a student in the College of Engineering and Science. Scholarship winners are eligible for internships. Appleman began a summer internship at DEI in late May.

Imtiaz Haque, chairman of Clemson's mechanical engineering department, said the DEI partnership offers students a rare entrée into the motorsports industry.

"The Dale Earnhardt Inc. organization is a prime example of quality and commitment to excellence in the motorsports industry," he said. "The combination of a scholarship and an internship means not only financial support but the opportunity for students to interact with and learn from the best the industry has to offer. We are grateful for their support."

DEI Chief Executive Officer Teresa Earnhardt and Clemson University President James F. Barker signed a memorandum of understanding last year to create a formal research and higher education partnership.

Teresa Earnhardt, founder and chairwoman, The Dale Earnhardt Foundation; Casey Appleman, Dale Earnhardt Motorsports Scholarship winner; Imtiaz Haque, Clemson mechanical engineering department chair; Dick Baker, executive director, The Dale Earnhardt Foundation. Photo courtesy of Dale Earnhardt Inc.

Clemson digital production arts graduates help win Oscar

Graduates of Clemson University's digital production arts program (DPA) are part of a team that won the Oscar for visual effects for the movie "The Golden Compass." The digital artists who graduated from Clemson and worked on the movie are: Rachel Drews, '06; Marc Bryant, '99; Wil Whaley, '99; Josh Tomlinson, '02; and student Mikki Rose.

Visual effects supervisor Bill Westenhofer with Clemson DPA alumna, Rachel Drews.

Clemson digital artists worked on the movie with Rhythm and Hues' visual effects supervisor Bill Westenhofer, who received the 2008 Academy Award for Achievement in Visual Effects for "The Golden Compass."

"It is a great honor to be a part of the team that won an Oscar for Best Visual Effects for 'The Golden Compass,' Drews said. "I am only one of many, many visual effects artists who worked on the film from Rhythm and Hues, and I am pleased to already be working with the best in the industry. My degree in digital production arts at Clemson gave me the technical and production knowledge base, as well as the connection to the people in the VFX industry."

The Master of Fine Arts in Digital Production Arts (DPA) at Clemson University is a professional degree program aimed at producing technically savvy, artistically talented graduates who are sought after by the growing electronic arts industry, particularly by those companies engaged in special effects within the entertainment and commercial video, film and gaming industries.

Digital Production Arts comprises approximately 30 graduate students and faculty from multiple disciplines in the university. Graduate students in the program are often offered major motion picture animation jobs in places across the country, including New York, Atlanta, San Francisco and Hollywood.

Robert Davis, senior vice president, Product Development and Quality, for Mazda North American Operations, and Esin Gulari, dean of the College of Engineering and Science at Clemson, with a Mazda CX-7 crossover vehicle.

CU-ICAR partners with first Asian OEM: Mazda

The Clemson University International Center for Automotive Research (CU-ICAR) recently announced that Mazda North American Operations, headquartered in Irvine, Calif., will be the first Asian Original Equipment Manufacturer to partner with CU-ICAR.

The announcement was made at the Carroll A. Campbell Jr. Graduate Engineering Center on the CU-ICAR campus with Mazda representatives.

The Mazda Foundation will provide an initial pledge of $30,000 to CU-ICAR for the Mazda Annual Graduate Fellowships program. The fellowships are performance-based and renewable for up to three years for a potential total of $90,000. In addition, the company will donate a CX-7 crossover SUV, drive trains, sub-assemblies and other components to be used as learning tools by Clemson students and faculty.

"We are delighted to welcome Mazda to CU-ICAR," said Esin Gulari, dean of the College of Engineering and Science at Clemson. "The strength and visibility of the Mazda brand worldwide makes this a key partnership, and we look forward to having our students interact and learn from this automotive leader. This connection with Mazda will open many doors for them as they continue into their careers. The fellowships are critical to the success of our program and the availability of Mazda automotive products for real-world study is invaluable. We look forward to a long and productive relationship."

As part of the agreement, three $10,000 fellowships will be provided to graduate students majoring in automotive engineering through the department of mechanical engineering within the College of Engineering and Science.

"We are thrilled to affiliate with this dynamic new research facility with support from both the Mazda Foundation and Mazda North American Operations. The work that the CU-ICAR graduate students undertake now will lay the foundation for groundbreaking advancements in the automotive industry in the future," said Robert Davis, senior vice president, Product Development and Quality, for Mazda North American Operations and a 1985 Clemson graduate.

Known for creating cars that are stylish, insightful and spirited, as well as affordable and fun to drive, Mazda infuses the "soul of a sports car" into every vehicle it builds, Davis said.

Mazda North American Operations oversees the sales, marketing, parts, accessories and customer service support of Mazda vehicles in the United States, Canada and Mexico through nearly 900 dealers.

CU-ICAR is a new model for economic development in South Carolina, matching Clemson's strengths in automotive engineering with the state's strong automotive economic cluster. Located in the heart of the Interstate 85 corridor, midway between Charlotte, N.C., and Atlanta, Ga., CU-ICAR is ideally situated in the Southeastern automotive and motorsports economy.

Engineering and Science dean establishes endowment

Esin Gulari, dean of the College of Engineering and Science at Clemson University, has established a Dean's Leadership and Service Award Endowment with a $25,000 pledge. The endowment provides awards for leadership and service to faculty and department chairs within the college. Gulari also made an additional gift to create an annual award this year.

"It is an honor for me to do this," said Gulari. "There are so many worthy recipients within our college. There are many hard-working faculty and department chairs that deserve to be honored for the work they do over and above what is required of them. I am very proud of my department chairs and the faculty in the college."

"This generous donation is a wonderful gesture by Dean Gulari," said Clemson University Director of Development and Alumni Affairs Brian O'Rourke. "While the endowment was set up to further leadership and service, it is Dean Gulari who is leading and serving by example."

The first award was issued in Spring 2008 and was determined by a faculty committee (see related story, page 4).

Gulari was named dean in the College of Engineering and Science in July 2006. She previously served as the department chairwoman of Chemical Engineering and Materials Science at Wayne State University and as director of the Chemical and Transport Systems Division and acting assistant director for engineering at the National Science Foundation.

Faculty NEWS & Notes

Clemson researchers receive NSF CAREER awards

The Faculty Early Career Development (CAREER) Program offers the National Science Foundation's most prestigious awards in support of the early career-development activities of teacher-scholars. Four Clemson faculty were honored with CAREER awards this spring.

Mechanical engineering professor, **Yong Huang**, director of the Clemson Advanced Manufacturing and Systems Integration Laboratory, received an NSF CAREER award for his work with laser-assisted living cell-printing research. The safe and efficient implementation of cell printing may someday assist in production of on-demand human organ manufacturing for organ transplant patients.


Huang


Ke

Clemson biophysicist **Pu-Chun Ke** has received his National Science Foundation CAREER Award for research into the self-assembly of carbon nanomaterials in living systems and how they impact human health and the environment. In his research, Ke discovered that certain mammalian colon cancer cells contract when cell membranes interact with nanoparticles. This experiment offered a first-hand look at how nanomaterials interact with cell membranes and may trigger toxicity.

Krishna P.C. Madhavan, assistant professor of engineering and science education in the School of Computing, has received a National Science Foundation (NSF) CAREER Award for research on how cyber-tools and cyber-environments better enable learning in engineering disciplines. Madhavan's research looks at how virtual environments that focus on cutting-edge engineering problems can be better designed to produce positive learning outcomes for engineering students.


Madhavan


Wen

Associate bioengineering professor, **Xuejun Wen**, received his NSF CAREER award for the work he is doing to improve the survival of transplanted cells. Since cell transplantation may be used for the treatment of many diseases, such as diabetes, heart infarction, liver damage, brain injury, Parkinson's disease, and stroke, his novel strategy may be applicable to a variety of applications. Cell transplantation treatment is hampered by the typically low viability of transplanted cells.

School director recognized


Richardson

Kathleen Richardson, director of the School of Materials Science and Engineering at Clemson University, has received a rare double honor.

She has been elected to the grade of Fellow of the Society of Photo-Optical Instrumentation Engineers (SPIE), and has also presented the annual Samuel R. Scholes Award Lecture at her alma mater, Alfred University. The lecture is given each year by a distinguished glass scientist or engineer invited for his or her contributions to the field. Richardson is known for her important technical contributions to understanding the properties and performance of infrared glass and other optical materials.

Richardson joined Clemson in 2005 from the University of Central Florida's College of Optics and Photonics.


Haque

Mechanical engineering chair honored by ASME

Imtiaz Haque, department chair and professor of mechanical engineering, has been named a Fellow of the American Society of Mechanical Engineers. The fellow grade is the highest elected grade of membership within ASME and recognizes significant engineering achievements and contributions to the engineering profession.

Haque has conducted research on the dynamics of vehicle systems since 1975, contributing to a fundamental understanding of the behavior of rail and automotive systems. He is a long-time member of ASME and the Society of Automotive Engineers (SAE).

With industry leaders and faculty at Clemson, Haque has led the effort to develop an exceptional graduate program in automotive engineering within Clemson University's International Center for Automotive Research (CU-ICAR) campus (see related stories, pages 1 & 3).

Civil engineering professor named ASCE Fellow


Juang

Hsein Juang, professor of civil engineering, has been elevated to the Fellow membership grade of the American Society of Civil Engineers in recognition of his accomplishments and contributions to the field.

Juang joined the faculty of Clemson University in 1982. He has a broad research interest in the field of geotechnical engineering.

He received the Clemson University Board of Trustees Award for Faculty Excellence (2002); the McQueen Quattlebaum Award (2008), and appointment to Chair Professor at National Central University, Taiwan (2008).

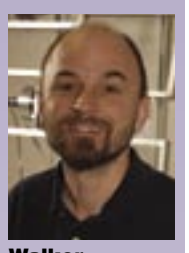

Tritt

Governor's Award presented to Tritt

This has been a remarkable year for Clemson physics and astronomy professor, **Terry Tritt**, culminating with the 2008 Governor's Award for Excellence in Scientific Research. Tritt heads up the Department of Energy's Center of Excellence in Thermoelectric Materials Research at Clemson, one of the leading laboratories for thermoelectric materials in the world. This national center focuses on the next generation of thermoelectric materials for power conversion and refrigeration.

Tritt also was recognized with the College of Engineering and Science's Award for Faculty Achievement in the Sciences and the university's Alumni Award for Outstanding Achievement in Research (see below).

University alumni award goes to two CoES faculty


Walker

This year's Alumni Award for Outstanding Achievement in Research, given annually by the Clemson Alumni Association to a faculty member who demonstrates outstanding ability and commitment to research, was presented to two professors: **Terry Tritt**, professor of physics and astronomy, and **Ian Walker**, professor of electrical and computer engineering. The selection committee found both of these outstanding College of Engineering and Science faculty deserving.

Bioengineering professor receives Sigma Xi award


Burg

The Clemson Chapter of Sigma Xi - The Scientific Research Society presented its Outstanding Researcher of the Year award to **Karen Burg**, Hunter Endowed Chair and professor of bioengineering. Burg's work has focused on tissue engineering with both orthopedic and soft tissue applications. She was recently elected to the North American Council of the Tissue Engineering International and Regenerative Medicine Society, and was invited by the National Academy of Engineering to present her team's work in the area of tissue engineering at the recent National Academies Indo-American Frontiers of Engineering meeting in Irvine, Calif.

College Faculty Awards

Each spring, the College of Engineering and Science honors outstanding faculty with several awards that recognize excellence in teaching and research.


Gooding

For the first time, the college presented the Leadership and Service Award, which is intended to recognize college faculty that undertake leadership and service roles that require selfless commitment of time and effort. Over the past 27 years, **Charlie Gooding**, professor of chemical and biomolecular engineering, has developed a reputation as a devoted and innovative teacher, department chair, and faculty representative from the College of Engineering and Science to the Faculty Senate. He served in several capacities, including vice-president and president. During his time on the Faculty Senate, he contributed to well-over 100 committees.


Duchowski


Gramopadhye

The college's Collaboration Award, recognizes a team of two or more faculty that has demonstrated exemplary and synergistic collaboration in research and/or teaching and has made notable contributions to the College. This year's team is headed by **Andrew Duchowski**, associate professor in the School of Computing and **Anand Gramopadhye**, professor and department chair of industrial engineering. This collaboration has resulted in the creation of two distinct, but complementary laboratories on campus: the Virtual Reality and Eye Tracking Laboratory and the Advanced Technology Systems Laboratory.


Jalili

The Murray Stokely Award is given to a faculty member in engineering for excellence in teaching at the undergraduate and/or graduate level with emphasis on the most recent three years. This year's award was presented to **Nader Jalili**, associate professor in mechanical engineering.


Dean

Brian Dean, assistant professor in the School of Computing, was honored with the Award of Excellence for Teaching in the Sciences. The award is given to a faculty member in sciences or textiles to recognize excellence in teaching at the undergraduate and/or graduate level with emphasis on the most recent three years.

The Faculty Achievement in the Sciences Award is given to a faculty member in recognition of high achievement during the preceding year, including accomplishments, distinctions, and awards within the past three years. This year the nominees were so outstanding that the committee could not decide on just one award recipient.


Marcus

The first recipient, **Terry Tritt**, is a professor in physics and astronomy, and the second awardee is **Ken Marcus**, professor of chemistry.

Bryant Nielson, assistant professor in civil engineering, is the recipient of this year's Byar's Prize for Excellence in Teaching, which recognizes outstanding instruction in engineering fundamentals.


Nielson

On the staff side

WISE director honored

Serita Acker, director of Clemson's Women in Science & Engineering (WISE) program, was recently elected Director of Professional Development for the Women in Engineering Programs & Advocates Network (WEPAN). WEPAN is a national not-for-profit organization with over 600 members from nearly 200 engineering schools, small businesses to Fortune 500 corporations, and non-profit organizations. WISE was honored with the National WEPAN Award in 2005 for its initiatives in exposing young women to the fields of engineering and science, and for its dedication to mentoring women in these majors.

Acker joined Clemson's Programs for Educational Enrichment and Retention (PEER) staff in 1995, which led to her involvement with WISE. Under her leadership, WISE has expanded to include outreach programs for females from kindergarten through 12th grade as well as current undergraduate female students. Acker was recognized as the University's 2005 Outstanding Woman in the classified staff category. She is the author of *Math, Science and Engineering: It's a Girl Thing*, a book geared to introduce young women to engineering and science professions.

Girl Scouts "WISE" up

Why do some shampoos lather more than others? What does it take to build a robot? How does global positioning work? South Carolina Girl Scouts found out when they explored engineering and science at Clemson University on "Introduce a Girl to Engineering and Science Day," now in its 7th year.

Seventy girls, in 4th-12th grades, from across the state attended the workshop sponsored by Clemson's Women in Science and Engineering (WISE) program, Lockheed Martin and Girl Scouts of the Old 96 Council. The girls will mix chemicals to create shampoo, conduct weather experiments, build robots, and complete a GPS scavenger hunt.

"We expose these young women to career options in engineering and science and demonstrate how engineering and science affects everyday life," said Serita Acker, program director of Clemson's WISE program. "There is still a deep-rooted belief that only boys are inventors. We need to teach our girls that they can be part of the design teams that are continually shaping the world."

Jennifer Ogle (right), assistant professor in civil engineering, leads visiting Girl Scouts in a Global Positioning System (GPS) scavenger hunt.

Alumni in the Spotlight

White House honors chemistry alumna

Lisa Coward Peake *(B.A. CH '01)* recently received the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST). The award is funded through the National Science Foundation (NSF), and honors one teacher from each of the 50 states.

Peake, a chemistry teacher at Wesley Chapel High School in Wesley Chapel, FL, teaches regular and AP chemistry. She participates in the University of Florida's summer research program for teachers to enhance her teaching skills and better engage her students. She has also been recognized as a National Honor Roll Outstanding American Teacher.

Peake has made presentations at the National Science Teachers Association and the American Chemical Society. She is a member of the Golden Key National Honor Society and National Chemistry Honor Society.

The photograph at the (left, right) shows her with her Presidential citation, accompanied by NSF Director Arden Bement (left) and Dr. Cora Marrett, the Assistant Director for Education and Human Resources at the National Science Foundation.

Outstanding Young Alumni recognized

At the 13th annual Engineering and Science Banquet, two outstanding alumni were recognized for making significant contributions to the world around them. They received an Outstanding Young Alumni Award for 2008 for significant career success and notable contributions to society.

Robert Ross, a resident of Argonne, Ill., received a bachelor of science in computer engineering in 1994 from Clemson, followed with a Ph.D. in 2000. He's been recognized with a Presidential Early Career Award and R&D 100 Award, a mark of excellence recognizing the most innovative ideas of the year. His work with MPICH2, a high-performance software application, enables developers to run the same code on a wide variety of platforms, from laptops and workstations to the largest and fastest parallel computers in the world.

Andrew Sowder, a resident of Charleston, S.C., is a physical scientist whose research has focused on the environmental behavior and effects of uranium and nickel. He has served as technical liaison in the U.S. effort to assist with the Chernobyl cleanup and stabilization. Recently, as a foreign affairs officer, he has helped negotiate agreements through which foreign countries and the United States cooperate to keep nuclear materials out of the hands of terrorists. Sowder obtained his Ph.D. in environmental engineering and science from Clemson in 1998.

Love tapped to lead Michigan department

Nancy Love *('94 Ph.D. ESE)* has been appointed chair of the Department of Civil and Environmental Engineering at the University of Michigan. After completing her doctorate in environmental systems engineering at Clemson, she joined the civil and environmental engineering faculty at Virginia Tech. Her research accomplishments and potential were acknowledged early with a prestigious National Science Foundation CAREER Award for young faculty. She was the inaugural recipient of the Water Environment Research Foundation's (WERF) Paul L. Busch Award, which honors superior achievement and creative vision in water quality and water environment research. In 2002 she was recognized by Clemson's College of Engineering and Science with an Outstanding Young Alumna award.

Two Clemson alumni are making Republic Locomotive a moving force

Clemson alums, Jason Byrd (left) and Ed Sherman, take a spin on one of Republic Locomotives' newest RX 500s.

Ed Sherman and **Jason Byrd** are a generation apart, Clemson alumni from different fields who work together pursuing a common goal. They have a passion for making Republic Locomotive the leader in yard switchers – rail locomotives that are used in industrial applications, moving coal at power generating facilities, for example. Republic's RX 500 is the only switch locomotive in the country that's being built new from the rails up.

Sherman, a 1964 textile management graduate, joined Republic Locomotive after a long, distinguished career as a personnel recruiter for the textile industry. As Republic's manager of business development, he looks for opportunities in a ready-made market. With a country full of aging yard switchers, his job is to convince potential clients that buying a new, energy-efficient, environmentally-friendly locomotive makes more sense than rebuilding a decades-old, diesel-guzzling hulk. An RX 500 can save over 1,000,000 gallons of fuel over its lifetime, and carries a Tier 3 environmental designation for reduced emissions.

Byrd, a 2003 electrical engineering graduate, never imagined that his degree would lead to a career in locomotive manufacturing. Today's RX 500, a sleek modern marvel, features a new brake system he designed, as well as important safety features that make the unit state-of-the art. He has also been involved with assembling the drive computer arrays, allowing for remote operations, which in his words, makes control "almost like playing a video game."

These two Clemson alumni are part of a unique and talented production team. The company has quadrupled their output this past year and is working towards producing one unit a week. Republic Locomotive makes its presence felt internationally, with switchers in the U.S., Canada, and Russia.

Charles McDonald brings electronics expertise to Machining and Technical Services

Charles McDonald *('02 B.S. EE;'04 M.S. EE)* is now part of Machining and Technical Services (MTS), a research support group located in the College of Engineering and Science that provides services campus wide. MTS offers engineering design and drafting assistance, along with precision machining and fabrication. McDonald's academic training and work experience is in electrical engineering, boosting MTS expertise in:

- Engineering Design of Electrical, Mechanical and Integrated Systems
- Computer Controlled Systems and Applications Programming
- Electronic, Electrical and Electromechanical Repair

When he's not providing electronics services on campus, McDonald practices his culinary skills creating mouth-watering, prize-winning barbecue.

Student Activities

Three-peat: Top Ph.D. computer graphics innovator nabs prestigious NVIDIA Fellowship

For the third year in a row, **Jay Steele**, a Ph.D. student in computer graphics in the School of Computing, has received the prestigious NVIDIA Fellowship Program award for his work to solve complex visual-computing challenges. NVIDIA Corp. is recognized as a world leader in visual-computing technologies.

"A third consecutive NVIDIA Fellowship is unprecedented at Clemson and speaks volumes about the quality of Jay Steele's research and our computer graphics faculty and students," said School of Computing professor and acting director, Robert Geist. "There were several hundred applicants vying for this fellowship and only 10 were selected."

Steele's research centers on the use of Lattice-Boltzmann (LB) computational-modeling methods to chart fluid flows and high-performance computing with graphics-processing units (GPUs). These methods allow accelerated computation of realistic lighting, which improves the realism of rendered scenes. An example of an application is the development of realistic virtual renderings of trees.

The NVIDIA Fellowship Program attracts an elite group of researchers and scientists from around the world. As an award winner, Steele will receive $25,000 to further his research. Along with Steele, other 2008-2009 recipients include Ph.D. students from Cornell University, Texas A&M, University of California at Berkley, Georgia Institute of Technology and University of Maryland, among others.

Honors and Awards

The Samuel B. Earle Award recognizes the most outstanding senior in engineering on the basis of scholarship and character. This year's honoree is **Joshua G. Pelkey** computer engineering.

Justin D. Moody was honored with the Outstanding Senior Award in the Sciences, which is based on scholarship and character.

Suzanne M. Sawicki bioengineering, was the recipient of the Robert W. Moorman Award, which honors the most outstanding junior in engineering on the basis of scholarship and character.

The Outstanding Junior Award in the Sciences is given on the basis of scholarship and character. This year's honoree is **Christopher J. Pollock**, who is pursuing an undergraduate degree in chemistry.

John P. Dixon ceramic and materials engineering, was recognized with the J. Wesley Davis Leadership Award, for outstanding scholarship, leadership in a student engineering organization, and high potential for success in the engineering profession.

Each college is invited to select one student to receive the Phi Kappa Phi Certificate of Merit. The student must be a graduating senior with a GPA of 3.4 or above and have made noteworthy contributions in such areas as leadership, service, and creative endeavors to his/her department, college, and Clemson University. The chosen student was **Tara M. Hudak** chemical engineering.

Angelina V. Gleason, civil engineering, was recognized with the Blue Key Academic and Leadership Award. Tigerama funds established an award endowment for one student in each of the University's five colleges who has distinguished themselves in academic scholarship and campus leadership.

Scott T. Iacono, chemistry, and **Andrew R. Dalton**, computer science, were awarded Outstanding Graduate Researcher Awards, which recognizes exemplary research.

The Outstanding Graduate Teaching Assistant Award is given to two graduate teaching assistants who have been recognized by faculty, students, and fellow graduate teaching assistants for their skills in undergraduate teaching. Chosen this year were **Jessica M. Green** polymer and fiber science and **John J. Light, IV**, mathematical sciences.


Pelkey


Moody


Sawicki


Pollock


Dixon


Hudak


Gleason


Iacono


Dalton


Green


Light

CoES students named Goldwater Scholars


Calhoun Honors College students Shannon Edd (left) and Julee Alaina Floyd have been named Goldwater Scholars.

Two Calhoun Honors College students have been named Goldwater Scholars. **Julee Alaina Floyd** (right), is a junior majoring in chemical engineering. **Shannon Edd**, also a junior, is majoring in mechanical engineering. Floyd conducts research with Professor Mike Kilbey, and Edd has been engaged in research with Professors John Ziegert, Sherrill Biggers, Paul Joseph, and Laine Mears.

The Goldwater Foundation is a federally-endowed agency established by Public Law 99-661 on November 14, 1986. The Scholarship Program honoring Senator Barry M. Goldwater was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences, and engineering. The Goldwater Scholarship is the premier undergraduate award of its type in these fields.

CoES Students receive major awards

The National Science Foundation (NSF) recently announced its list of Graduate Research Fellowship awards for 2008. Three CoES undergraduates won fellowships, and 5 received honorable mentions.

The fellowship winners are:

Name	Field of Study
Offered Awards:	
Robert N. Clarke	Physics and Astronomy
Alexandra L. Foguth	Engineering - Materials
Russell Hedden	Physics and Astronomy
Sagar R. Shah	Engineering - Bioengineering and Biomedical
Honorable Mention:	
Daniel R. Eils	Engineering - Mechanical
Sabrina H. Lau	Engineering - Mechanical
Stephen F. Poterala	Engineering - Materials
Michael A. Soltys	Engineering - Civil
Mary K. Watson	Engineering - Energy

Two Clemson students receive Google scholarships


Sally Wahba, (left), and Yvon Feaster

Two students from Clemson University's School of Computing received the 2008 Google Anita Borg Memorial Scholarship: **Sally Wahba**, (left), a second year Ph.D. student from Cairo, Egypt; and **Yvon Feaster**, a senior in computer information systems from Clemson.

The Google Anita Borg Memorial Scholarship was created to encourage women to excel in computing and technology and become active role models and leaders. Scholarships are awarded based on the strength of candidates' academic background and demonstrated leadership. Wahba and Feaster both received a $10,000 scholarship for the 2008-2009 academic year. Remaining finalists received $1,000 each.

"I didn't expect to get the scholarship because all those who received it from previous years were from the top 10 universities, and less than 10 percent of those who apply received it," said Wahba. "I was extremely happy when a representative from Google called to inform me I received the scholarship."

Scholarship applicants must meet the following requirements: be entering their senior year of undergraduate study or be enrolled in a graduate program in 2008-2009 at a university in the United States; major in computer science, computer engineering or a related technical field; be enrolled in full-time study in 2008-2009; and maintain a cumulative GPA of at least 3.5.

"I feel extremely honored to have been selected for this scholarship. Anita Borg was a champion advocate for women in the science and technology field, and I commend Google for honoring her life's work with these scholarships," Feaster said.

World-renowned bioengineers record history of medical inventions

If you have contact lenses, an artificial hip joint, a dental implant, a mechanical heart valve or just about any medical device in your body, you can thank a bioengineer.

To commemorate the contributions of bioengineers that have benefited so many since the 1960s, Clemson University hosted the Society for Biomaterials (SFB) History Summit recently. The society's founders and past presidents, an international group, gathered to record an audio history of the society and origins of bioengineering inventions and devices from the last four decades.

"This is an unprecedented gathering of the greatest minds in bioengineering," said Martine LaBerge, chairwoman of the department of bioengineering and president of the SFB. "It is a great honor for Clemson University to host this memorable event where the enthusiasm of participating past presidents and founders of the SFB is only surpassed by their dedication for a field that is the cornerstone of medical technology today."

Martine LaBerge, chairwoman of the department of bioengineering and president of the Society for Biomaterials (SFB) leads a session at the SFB History Summit held recently at Clemson. The society's founders and past presidents, an international group, gathered to record an audio history of the society and origins of bioengineering inventions and devices from the last four decades.

The outcome of the summit will be the audio recording and the publication of a monograph that captures the historical background of the society to be shared and built upon by present and future bioengineers.

"We are, in essence, passing the torch," said Samuel F. Hulbert, chairman of the event and president-emeritus of Rose-Hulman Institute of Technology. He also is the founder and a past president of the SFB. "The outcome of this summit will assure that the SFB's rich past and the foundation for an exciting future is not forgotten."

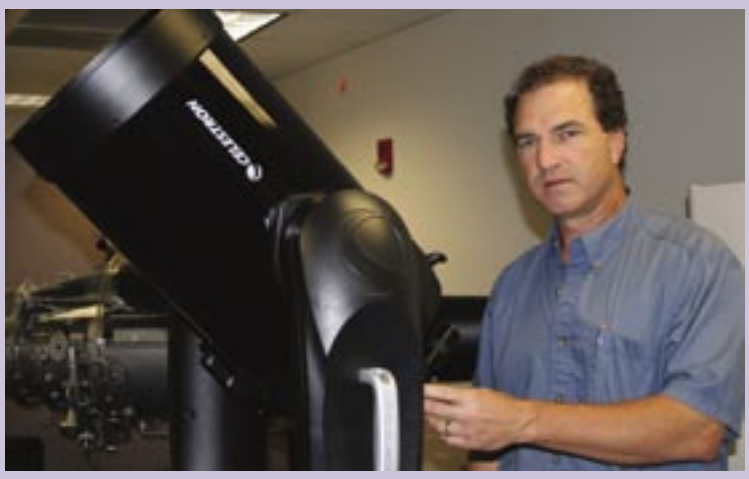
The SFB is the premier professional society that promotes advances in all phases of materials research and development by encouraging cooperative educational programs, clinical applications and professional standards in the biomaterials field. More than 1,500 members worldwide represent industry, medicine, academia and regulation.

Clemson astrophysicists to collaborate with S.C. State to boost minority Ph.D.s

Clemson University astronomy researchers will collaborate with South Carolina State University (SCSU) to build and reinforce a program of forefront astronomy research at SCSU as part of a $2 million-plus National Science Foundation award. For its part, Clemson will receive $319,000 of the award.

"Our goal is to pave a pathway for SCSU's students to obtain Ph.D.s in physics and astronomy at Clemson and elsewhere," said Mark Leising, astrophysics professor and principal investigator on the project at Clemson. "These students are hugely underrepresented among doctoral students in the physical sciences."

Leising says Clemson's role is to collaborate with SCSU, provide research projects and observing opportunities for their students, and prepare and mentor those who come to graduate school.



Mark Leising, a Clemson astrophysics professor, is serving as principal investigator for an NSF project to build and reinforce a program of forefront astronomy research at South Carolina State University (SCSU).

"There are bright students interested in science at universities like SCSU, but few go on to get doctorates and become leaders in the physical sciences. Our experience is that students who get the chance to participate in forefront research, discovering new knowledge rather than just reading about it, are more likely to pursue a career in science," said Leising.

Clemson will offer the expertise of its astronomy faculty and access to observing facilities, including its part of the 36-inch diameter SARA telescope along with some of its time on the four-meter diameter Mayall telescope, both on Kitt Peak in Arizona. Students will research the largest explosions in the universe, the production of the elements in stars, the formation of solar systems and exotic double-star systems.

RISE co-directors Susan Smith (left) and Janeen Putman participated in a site visit from the National Study of Living-Learning Programs (NSLLP). The study found Clemson's Residential Community in Science and Engineering (RISE) Program to be one of the best in the country.

RISE – moving on up!

Clemson's Residential Community in Science and Engineering (RISE) Program has been judged to be one of the best living-learning programs in the country. RISE operates under the auspices of the Department of Engineering and Science Education, within the College of Engineering and Science.

Karen K. Inkelas, associate professor at the University of Maryland, conducted two large-scale studies of more than 46,000 undergraduates in living-learning programs across 67 college campuses across the United States. In the 2007 data collection, there were over 600 living-learning programs represented in the study. National Science Foundation (NSF) funding allowed special focus on STEM-related living-learning programs.

Inkelas' research, called the National Study of Living-Learning Programs (NSLLP), discovered that students in Clemson's RISE Program exhibited – *by far* – the strongest outcomes. Specifically, RISE students at Clemson recorded the highest mean scores in their perceptions of: a) their ease with the transition to college, b) their growth in cognitive development, c) their ability to apply content learned in class to personal values, d) their sense of belonging to the larger campus, and e) confidence in both mathematic skills and future professional success.

Inkelas indicated that the RISE website offers a rich amount of information and is the "best individual living-learning program website" she had visited on the internet. She was also very complimentary of the RISE faculty and staff who hosted the site visit team, specifically citing contributions by interim department chair, Ben Sill, and program coordinators, Janeen Putman and Susan Smith.

Chemical engineering professor, Amod Ogale has received a Department of Energy grant to research the use of carbon fibers in nuclear power generators.

Researcher studies carbon fibers for nuclear reactor safety

Carbon fibers that are only one-10th the size of a human hair but three times stronger than steel may hold up to the intense heat and radiation of next-generation nuclear power generators, providing a safety mechanism. The "Gen IV" power-generating reactors are being designed to provide low-cost electricity, but with a built-in safety mechanism current reactors do not have.

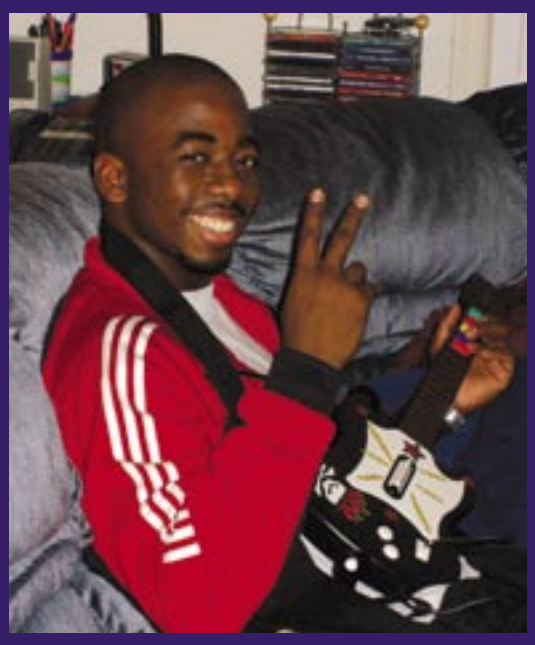
The Department of Energy (DoE) has awarded Clemson University chemical engineering professor Amod Ogale, deputy director of the Center for Advanced Engineering Fibers and Films (CAEFF), a $450,000 grant to research carbon fibers embedded into a carbon matrix that do not melt in extreme temperatures for potential use in Gen IV power generators. About 20 percent of electricity produced in the United States is from nuclear sources.

"One proposed design of the next generation of nuclear plants will consist of a helium-cooled generator that will operate in the range of 1,200 to 1,800 degrees Fahrenheit," Ogale said. "A critical safety requirement for this reactor is that it can shut down safely in the event of a malfunction where coolant flow is interrupted. Steel alloys currently used internally in reactors melt at the peak temperature of 2,500 degrees Fahrenheit, where carbon-fiber composites do not."

Carbon-fiber composites already are used successfully in jetliner brake systems because of their ability to withstand high temperatures without melting. However, their performance in a nuclear environment is not adequately understood.

Ogale and his team will study the neutron-radiation damage effects on carbon fibers. Irradiation experiments will be conducted in collaboration with researchers at Oak Ridge National Labs. South Carolina State University researchers also will participate in the study.

"This research will lead to a fundamental understanding of how the nanotubes set themselves up to provide radiation-damage tolerance to carbon fibers," said Ogale.



Memorial scholarship honors student

Ralph Nathaniel "R.J." Pinnock Jr., a senior chemical engineering major from Columbia, SC died from injuries sustained in a motorcycle accident last December. His passing was felt all over campus. He was vice president of the Pi Alpha Chapter of Alpha Phi Alpha, Inc., fraternity and assistant attorney general on the Clemson University Student Judicial Board. He played in the Clemson University Symphony Orchestra and competed in Intercollegiate Club soccer. Pinnock served as a member of Clemson's MLK Enhancement Committee and was a PEER (Program for Educational Enrichment and Retention) Mentor.

PEER director, Sue Lasser said, "Ralph's vibrant intelligence and swift, dry sense of humor made him good company." The younger engineering students "were lucky to have him as a PEER mentor," she said.

Hercules Incorporated, manufacturer of chemical specialties, had extended an offer of employment to this outstanding African-American chemical engineering student before his tragic passing. In honor of his memory, Hercules has established a fund called the *"Ralph Nathaniel Pinnock, Jr. Memorial Annual Scholarship."* This scholarship seeks to provide financial support to promote diversity for underrepresented student populations in the Department of Chemical and Biomolecular Engineering.

Mr. Bruce Hohensee, of Hercules, said, "We were excited that Ralph was going to join us this summer, and were deeply saddened at his death. We believe that others may be moved to contribute to this memorial scholarship to commemorate and honor this fine young man. Hopefully the endowment will reach a level that will allow the scholarship to become an endowment and last in perpetuity."

People who wish to make a contribution to this scholarship are asked to complete the form below and return it in the business reply envelope provided.

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- ☐ College of Engineering & Science
- ☐ Department/School:

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